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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,596	03/29/2004	Xiaodong Cui	TI-37147	2740

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TEXAS INSTRUMENTS INCORPORATED
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EXAMINER

RIDER, JUSTIN W

ART UNIT	PAPER NUMBER
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2626

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/811,596	Applicant(s) CUI ET AL.	
	Examiner JUSTIN W. RIDER	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. In response to the Office Action mailed 25 September 2007, applicant submitted a response filed 26 December 2007, in which the applicant amended claims 1 and 3-8 without adding new matter. Applicant added new claims 10-12.

Response to Arguments

2. Applicant's arguments filed 26 December 2007 have been fully considered but they are not persuasive.

Regarding the Rejection of Claim 1

Applicant is traversing the previously presented claim rejections of claim 1 in Section II on pages 4-5 of Remarks. The examiner respectfully disagrees with applicant's rationale.

The feature vectors being updated in **Eberman** are, in fact, the factors being introduced to provide an updated change [scaling] to the input vectors. In this case, *corrected* vectors are applied to tainted vectors in order to provide a more accurate, updated version of the input signal based on input parameters. This disclosure is sufficient in that it explicitly discloses an updating of corrected (*i.e.* scaling) factors in a sequential manner.

Regarding the Rejections Under Section III of Remarks

It is believed that the arguments of Section III on pages 5-6 of Remarks directed toward the 35 U.S.C. §103 rejections. More specifically the rejection of claim 8 is directly related to the arguments posed with respect to claim 1. Therefore, the same rationale applies and the rejection of **Eberman**, in view of **Stylianou** is maintained.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-7, 9-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by **Eberman et al. (US Patent No. 5,924,065)** referred to as **Eberman** hereinafter.

Claim 1: **Eberman** discloses a method for updating covariance of a speech signal in a sequential manner (col. 5, lines 44-46), comprising:

- i. scaling a covariance of signals by a scaling factor (col. 6, lines 15-19);
- ii. updating the scaling factor based on a signal to be recognized (col. 6, lines 56-59);
- iii. updating the scaling factor each time new data of the signal is available (col. 6, lines 60-64); and
- iv. calculating a new scaling factor by adding a correction item to a previous scaling factor (col. 6, lines 64-67).

Claim 2: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the signal comprises a speech signal (Abstract).

Claim 3: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the scaling factor is a scaling matrix (col. 6, lines 15-19 and 56-64; col. 8, lines 10-25).

Claim 4: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the new available data of the signals is based on any length (col. 5, lines 18-21, *'The DSP 200 selects (210) time-aligned portions of the dirty signals.'*).

Claim 5: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the new available data of the signals is a frame (col. 5, lines 22-23).

Claim 6: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the new available data of the signals is an utterance (col. 9, lines 16-18, *'is chosen as the uttered speech.'*).

Claim 7: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the new available data of the signals is a fixed time period (col. 5, lines 22-23, a frame inherently encompasses a fixed period of time in a frequency-domain representation.).

Claim 9: **Eberman** discloses a method for updating covariance of a speech signal as per claim 1 above, wherein the correction is the product of any sequence whose limit is zero, whose summation is infinity and whose square summation is not infinity and a summation of quantities weighted by a probability (col. 6, lines 31-34, *'In the EM process described below, an expectation step and a maximization step are iteratively performed to converge towards an optimal result during a gradient ascent;'* col. 6, lines 47-49, *'because a robust speech processing system only needs to estimate some overall parametric statistic which can be estimated from the distribution using the EM [Expectation Maximization]process.'* [emphasis supplied].

Claim 10: **Eberman** discloses a method as per claim 3 above, wherein the scaling matrix is a diagonal matrix (Col. 8, lines 14-16).

Claim 12: Claim 12 is similar in scope and content to that of claim 1 above and so therefore is rejected under the same rationale.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Eberman** in view of **Stylianou (US Patent No. 6,266,638)** referred to as **Stylianou** hereinafter.

Claim 8: **Eberman** discloses a method as per claim 1 above, however failing to but **Stylianou** does, specifically disclose wherein a 10 minute segment of input speech is obtained in order to provide speech parameters (col. 3, lines 27-29, '*We have typically used between 3 and four segments (about 10 minutes of speech) for getting a good estimate of the parameters.*').

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to include the teachings of **Stylianou** in the method of **Eberman** because it provides a more comprehensive representation of input speech in order to make more accurate estimations with respect to key speech parameters (col. 2, SUMMARY).

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Eberman** in view of **Rajan (US 2002/0026253 A1)** referred to as **Rajan** hereinafter.

Claim 11: **Eberman** discloses a method as per claim 1 above, however failing to specifically disclose wherein the variance-scaling factor is exponential. However, referring back to applicant's specification, the intent behind exponential scaling factors is to ensure positiveness for the updated variance values (page 5, paragraph [0018]). In an analogous art, **Rajan** discloses a speech processing system wherein it is disclosed that variances used in updating parameters are always positive (page 5, Paragraph [0056]).

Therefore, it would have been obvious to one possessing ordinary skill in the art at the time of invention to include the teachings of **Rajan** in the method of **Eberman** because presenting finite values in exponential form inherently ensures a positive value and **Rajan** discloses this fact in implementing speech signal reconstruction processing that ensures accurate matching of reconstructed pieces.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN W. RIDER whose telephone number is (571)270-1068. The examiner can normally be reached on Monday - Friday 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. W. R./
Examiner, Art Unit 2626
18 March 2008

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626